

Claims

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1. A device for the visual verification of the angle dependent scattering characteristics of an object by an observer, with

a holding device (2) which has a measuring window (5) that can be brought into a predetermined relative position with respect to the object (4, 4', 4''), as well as an observation window (7) that can be viewed by the observer,

10 characterized by a light feed (6) which is carried by the holding device (2) and directs substantially parallel light beams (9) at a predetermined angle (α) onto the measuring window (5), and

15 a light guide device (11) which is carried by the holding device (2), captures a plurality of light beams (10) outgoing from a point of the measuring window (5) at different angles (β_1, β_2) and displays the light beams in parallel or convergingly in the observation window (7).

2. A device according to claim 1 characterized in that the light feed (6) and the light guide device (11) are arranged at the same side of the measuring window.

20 3. A device according to claim 1 characterized in that the light feed (6) and the light guide device (11) are arranged at different sides of the measuring window (5).

4. A device according to one of claims 1 through 3 characterized that in the observation window (7) as viewing screen

is arranged upon which the light beams (10) impinge adjacent one another.

5. A device according to one of the claims 1 - 4 characterized in that the light feed has a light source (17).

5 6. The device according to claim 5 characterized in that the light source (17) directs white light beams upon the measuring window (5).

10 7. A device according to claim 5 or claim 6 characterized in that the light source (17) is formed by at least one light emitting diode.

8. A device according to ~~claims 1 through 4~~ characterized in that the light feed (6) collects ambient light and directs the ambient light onto the measuring window (5).

15 9. A device according to claim 8 characterized in the light feed (6) is a light guide channel.

10. A device according to one of claims 1 - 9 characterized in that the light guide device is a collecting lens whereby the measuring window (9) lies in the region of the focal plane of the collect lens.

11. A device according to claim 10 wherein the collecting lens (11) is a cylindrical lens

12. A device according to claim 11 characterized in that the collecting lens (11) is configured as a semicylinder, whereby the measuring window (5) is located at, or at a small distance from, the flat side of the semicylinder.

13. A device according to claim 12 characterized in that the light guide (6) is embedded in the semicylinder (11).

14. A device according to one of claims 1 - 9 characterized in that the light guide device (11) is a cylindrical hollow mirror whereby the measuring window lies in the region of the focal plane of the hollow mirror.

15. A device according to one of claims 1 - 9 characterized in that the light guide device 11 is formed from individual light guide (19) which are respectively oriented to the light beams (10) reflected at different angles (β_1, β_2).

16. A device according to claim 15 characterized in that the ends (21) of the light guides (19) open adjacent one another in the observation window (7).

17. An apparatus for the visual comparison of the angle dependent scattering properties of a test object with a

respective reference object by an observer, characterized by at least two devices (1', 1'') according to one of claims 1 - 16 and which are connected together and have their observation window (7) lying adjacent one another.

5 18. An apparatus according to claim 17 characterized in that one of the devices (1') has a receiver (22) for the reference object (4'') and the other device has an abutment (25) for positioning the test object (4).

10 19. An apparatus according to claim 17 or claim 18 especially for flat bendable reference objects (4''), characterized in that the receiver (22) includes a drive (23) upon which one or more reference objects (4'') can be affixed.

15 20. An apparatus for the optical testing of flat objects characterized by the combination of:

a housing (30),

an emplacement surface (31) which is carried by the housing (3) and has at least one first region (33) and a second region (34) for supporting an object and for the sliding shifting thereof between the first and second regions,

20 a device (1) according to one of claims 1 - 19 which is carried by the housing (30) and whose measuring window (5) lies above the first region (33) of the emplacement surface (31) for falls together therewith, and

an infrared camera (31) which is carried by the housing (3) and is targetted on the second region (34).

21. An apparatus according to claim 20 characterized in that the infrared camera (37) is a black white CCD camera which is provided with a blocking filter (38) for the visible light range.

22. An apparatus according to claim 20 or claim 21 characterized in that a monitor (4) is provided which is carried by the housing (30) and is connected to the output of the infrared camera.

23. An apparatus according to one of claims 20 - 22 characterized in that the housing (30) has a second light source (41) which is trained from above onto the second region (34), has a significant proportion of its radiation in the infrared radiation and is selectively capable of being switched on.

24. An apparatus according to claim 23 characterized in that the second light source (41) is a glow filament lamp.

25. An apparatus according to claims 20 - 24 characterized in that second region (34) of the emplacement surface (31) is light permeable (42) and the housing (30) carries a third light source (33) which is trained from below onto the second region 34 and has a significant proportion of radiation in the infrared ranges and can be selectively switched on.

26. An apparatus according to claim 25, characterized in that the third light source (43) also has a significant proportion of its radiation in the visible light range.

5 27. An apparatus according to claim 26 characterized in that the third light source (43) is a glow filament lamp.

10 28. An apparatus according to one of claims 20 through 27 characterized in that the emplacement surface (31) has a third region (35) for supporting the object and for sliding shifting thereof between the first region (33), the second region (34) and the third region (35),

whereby the housing (30) carries a fourth light source (45) which is trained from above onto the third region 35 and has a significant proportion of radiation in the ultraviolet range.

15 29. An apparatus according to one of the claims 20 through 28 characterized in that the housing (3) has a cover hood (32) which is arranged above the emplacement surface (31) and has at least one lateral opening for access to the emplacement surface (31) .

20 30. An apparatus according to claim 29, characterized in that the third region (35) is spaced from the opening.

31. An apparatus according to one of the claims 20 - 30, characterized in that the emplacement surface 31 is equipped in a fourth region (36) with an inductive sensor.

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